

Amendments to the Claims

This listing of claims will replace all prior listings of claims in the application.

Listing of Claims

1. (Currently amended) A flat, hollow brushless motor comprising:

a flattened tubular motor housing sealed at both ends,
first and second housing through holes formed in a center of first and second end plate portions on both sides of the motor housing,

a rotor shaft of which a portion of both ends is exposed from the first and second housing through holes,

a tool-mounting hole that extends through a center of the rotor shaft and that has both ends thereof exposed from the first and second housing through holes, and

first and second workpiece insertion recesses formed in ~~external~~outer surfaces of the first and second end plate portions of the motor housing,

wherein the first and second workpiece insertion recesses ~~are recesses of a prescribed width formed encompassing the first and second housing through holes, respectively, and extending to an external periphery of the motor housing from the housing through holes~~with a fixed depth in central areas containing the housing through holes, and in areas extending in a radially same direction to external peripheral edges of the end plate portions continuously with the central areas on the outside surfaces of the end plate portions, so that the end plate portions have a reduced thickness at the workpiece insertion recesses.

2. (Previously presented) The flat, hollow brushless motor according to Claim 1, wherein the tool-mounting hole has a hexagonal cross section.

3. (Currently amended) The flat, hollow brushless motor according to Claim 1, wherein the maximum length in an axial direction of the rotor shaft is ~~equal to or~~ less than the thickness between bottom faces of the first and second workpiece insertion recesses in the first and second end plate portions on both sides of the motor housing.

4. (Previously presented) The flat, hollow brushless motor according to Claim 1, comprising a lead wire laying area extending to an outside in a radial direction from an external peripheral surface of the motor housing,

wherein lead wires disposed along a recess groove formed on an inside surface of the first or second end plate portion of the motor housing are brought out to the lead wire laying area.

5. (Previously presented) The flat, hollow brushless motor according to Claim 1, comprising a detection mechanism for detecting motor magnetic pole positions,

wherein the detection mechanism comprises an FG magnet disposed on one end face of the rotor shaft, and a magnetic sensor disposed on an internal surface of the first or second end plate portion facing the FG magnet in the motor housing.

6. (Currently amended) A flat, hollow brushless servomotor comprising:

a tubular motor housing sealed at both ends;

first and second flat end plates closing respective outer sides of said motor housing and forming outer end surfaces

thereof, said end plates having central through holes formed therein;

a hollow rotor shaft located ~~between~~ within respective planes defined by the parallel outer end surfaces of said first and second end plates and including a tool-mounting hole extending axially through a center thereof so that said central through holes and said tool-mounting hole are axially aligned to provide a central axially oriented open aperture extending through said brushless servomotor;

a first workpiece insertion recess formed in an external surface of said first end plate, said first workpiece insertion recess extending radially from said central aperture to an ~~external~~outer periphery of said ~~brushless servomotor~~first end plate; and

a second workpiece insertion recess formed in an external surface of said second end plate, said second workpiece insertion recess extending radially from said central aperture to an ~~external~~outer periphery of said ~~brushless servomotor~~second end plate.

7. (Currently amended) The brushless servomotor according to Claim 6, wherein the axial length of said rotor shaft is less than the radius of said rotor shaft so that said brushless servomotor is thin to enable insertion between facing portions of a workpiece for machining of a tip of the facing portions by a machine with a tool mounted in the tool-mounting hole of the rotor shaft and within said central aperture projecting axially outwardly beyond and transverse to the plane defined by the outer end surface of at least one of said end plates.

8. (Currently amended) The brushless servomotor according to Claim 6, wherein said ~~central aperture~~tool-mounting hole has a hexagonal cross section.

9. (Previously presented) The brushless servomotor according to Claim 6, including a detection mechanism for detecting motor magnetic pole positions.

10. (Previously presented) The brushless servomotor according to Claim 9, wherein said detection mechanism comprises a magnet disposed on an end face of the rotor shaft and a magnetic sensor disposed on an inner side of said first end plate.

11. (Previously presented) The brushless servomotor according to Claim 6, including a lead wire groove disposed on an inner side of said first end plate for receiving lead wires.

12. (Currently amended) The brushless servomotor according to Claim 6, including a machine tool mounted on the rotor shaft, said machine tool extending axially through said ~~a~~-tool-mounting hole and not extending beyond said central through holes so that said servomotor is capable of insertion between axially spaced facing portions of a workpiece.

13. (Previously presented) The brushless servomotor according to Claim 6, including a cylindrical stator assembly having drive coils and an insulator, said stator assembly disposed radially outwardly about said hollow rotor shaft and within said tubular motor housing.

14. (New) The brushless servomotor according to Claim 6, wherein said rotor shaft is entirely within said motor housing.

15. (New) The brushless servomotor of Claim 6, wherein said first and second flat end plates comprise essentially parallel end plates, except for said insertion recesses, to define parallel outer end surfaces.

16. (New) A flat, hollow brushless servomotor comprising:

a motor housing sealed at both ends;

first and second flat circular shaped end plates closing respective outer sides of said motor housing and forming outer end surfaces thereof, each said end plate having a central through hole formed therein;

a hollow rotor shaft positioned within said motor housing and between said first and second end plates and including a tool-mounting hole extending axially through a center thereof so that said central through holes and said tool-mounting hole are axially aligned to provide a central axially oriented open aperture extending through said brushless servomotor,

a first workpiece insertion recess formed in an external surface of said first end plate, said first workpiece insertion recess having a constant depth and extending radially from said central aperture to an outer periphery of said first end plate; and

a second workpiece insertion recess formed in an external surface of said second end plate, said second workpiece insertion recess having a constant depth and extending radially from said central aperture to an outer periphery of said second end plate,

wherein said first and second workpiece insertion recesses are oriented symmetrically on said first and second end plates for enabling insertion of said brushless servomotor between spaced and facing portions of a workpiece.

17. (New) The brushless servomotor according to Claim 16, wherein an axial length of said tubular motor housing is less than a radius of each said circular shaped plate for enabling insertion of said servomotor between inwardly facing portions of a workpiece.

18. (New) The brushless servomotor according to Claim 17, wherein the first and second end plates have a reduced thickness at the workpiece insertion recesses.